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AUTHOR Rappa, Joseph B.; Genova, William J.

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ABSTRACT

This paper reports the results of the final stage of a 30 month study of knowledge use in staff-initiated inservice workshops. In earlier stages of this study, knowledge acquisition, use, and impact correlated with multiple sets of participant, workshop, school, and community characteristics. Based on those results, a refined model was developed which depicts knowledge use as a more complex multi-staged, independent, iterative process that develops over time. For example, workshop characteristics show initially high correlation with knowledge use, but over time the initially weaker school variables increase in strength of association with each stage in the knowledge use process. This suggests that the school context constitutes the more pervasive and stable element in the knowledge use process. (Author/JD)

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The Knowledge Use Process and Staff Inservice Efforts in Education

Joseph B. Rappa
TDR Associates, Inc.
William J. Genova
TDR Associates, Inc.

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ABSTRACT

This paper reports the results of the final stage of a 2½ year study of knowledge use in staff-initiated inservice workshops. In earlier stages of this study, knowledge acquisition, use, and impact correlated with multiple sets of participant, workshop, school, and community characteristics. Based on those results, a refined model was developed which depicts knowledge use as a more complex multi-staged, interdependent, iterative process that develops over time. For example, workshop characteristics show initially high correlation with knowledge use, but over time the initially weaker school variables increase in strength of association with each stage in the knowledge use process. This suggests that the school context constitutes the more pervasive and stable element in the knowledge use process.

Introduction

Staff inservice training in education has assumed increasing importance in the past decade, and is especially critical in the present and immediate future. For example:

- continually declining student achievement levels require upgrading of standards, curriculum, and instruction;
- mandated programs such as special education, desegregation and basic skills require staff training for effective implementation;
- new technologies, such as computers and other forms of automation, are being tried by schools, in part to stimulate students' interest and in part to prepare them for the marketplace; school personnel must be equipped to manage the use of these technologies;
- budget cuts and personnel reductions have produced an older staff, many of whom require updated training or retraining to teach newly assigned or changing subjects.

Although the need for staff inservice has increased, research on effective practice fails to explain why much inservice work has mixed outcomes (Campbell, 1981; Holly, 1982). A review of published evaluations and research on inservice training indicates wide variation in participants' assessments of the need and usefulness of many of the training experiences provided (Cruickshank, et al., 1979; Joyce and Showers, 1980). After completing the same workshop, some participants will rate it as necessary and highly useful, while others assess it as unnecessary and "a waste of time."

The planners of inservice training often employ four strategies to reduce such variation. First, they conduct needs assessments to select inservice topics of greatest concern to potential participants. Second, they structure the inservice experience and select the instructor carefully. Third, they make participation voluntary rather than mandatory, to capitalize on the interest and motivation of self-selected members. Fourth, they enable participants to design and control their own workshop, in part or whole. These strategies for providing successful inservice are also combined in various ways.

The use of these strategies is, in fact, supported by very little research on the factors and conditions which affect inservice outcomes. What little research there is focuses on characteristics of the participants and of the inservice experience itself. In the current study we examine these factors, but we also report their interaction with classroom, school, district, and community contextual factors.

We include aspects of the larger organizational context because we hypothesize that what is learned and applied from inservice work by participants is need- and context-specific. For example, participants typically vary according to the strength of their individual psychological needs (e.g., for achievement and/or power), and with respect to the demands of the specific jobs they hold. They also differ in how alterable and supportive their job situations are. Thus, participants in situations that are high on such factors are likely to learn and to apply more than those with less intense personal needs, less exacting jobs, and less flexible work assignments. In this research we examine the effects of such contextual factors on inservice outcomes.

Background and Overview

The research reported in this article is based on the second phase of a 30-month study conducted by TDR Associates, Inc. in cooperation with the Commonwealth Inservice Institute (CII), an agency of the Massachusetts Department of Education. The research is supported by a grant from the National Institute of Education (NIE). The subjects of this study are participant-initiated staff inservice workshops funded by the Commonwealth Inservice Institute. Annually the CII awards approximately 400 small grants, ranging from $200 to $2,000 to local school districts that submit inservice proposals that give evidence of being: teacher or participant initiated; voluntary; based on documented need and approved by local administrator; and likely to have an impact on educational practice at the classroom, school or district level. Each of the inservice workshops examined incorporated one or more of the approaches described on page 3, above. The first phase of the study involved mailed, post-workshop questionnaires to 467 participants in one of 72 CII-sponsored inservice projects. For this part of the study, Knowledge Use from staff-initiated inservice was conceptualized as an interaction among several sets of variables. These sets were organized into two domains: Less Alterable Variables--staff background, staff traits (needs and concerns), and school characteristics; and More Alterable Variables--school climate and workshop characteristics (see Figure 1, below).

The ratings of these 467 teachers and administrators were placed into the two variable sets, regressed on and correlated with workshop impact. The original model appears to account for 64% of the variance in the participants

ratings of workshop success and impact (see figure 1 below) and was discussed in the Journal of Educational Research (Walberg and Genova, November-December, 1982).

Insert Figure 1 about here

This analysis was followed by a series of site visits and interviews with inservice workshop participants. These interviews were semi-structured and designed to evaluate the original conceptual model. Using the inservice workshop as the unit of analysis, mean ratings of knowledge use (actually ratings of knowledge acquired in the inservice workshop) were regressed against the mean ratings of impact for each project. The assumption underlying this analysis was that less knowledge acquired would result in less impact, and more knowledge acquired, would result in greater impact.

Figure 2, below, presents the results of this analysis. In order to test the efficacy of the original model, workshops were selected which had the greatest variance from the regression line. Thus, a total of 14 of the 72 inservice workshops were selected, seven with higher than predicted impact, and seven with lower than predicted impact. At each site at least five participants were interviewed: the workshop organizer(s) (convener(s)) and four other participants (teachers and/or administrators). A total of 78 participants were interviewed: 37 at high-impact workshops and 41 at low-impact workshops. These interviews were organized into 12 brief case studies and were subjected to cross-case analysis.

Insert Figure 2 about here

The follow-up interviews and cross-case analysis indicated several areas where the original model could be revised and refined. Furthermore a re-examination of the literature supported an expanded consideration of two specific elements in the study: The knowledge use process, and the organizational and psychological context in which that process takes place. These elements provided the basis for revising the conceptual model for the second phase of the study (February 1982 - July 1983).

The Social Context of Staff Development

Educators function and learn in a complex psychological and social environment. This environment is shaped by the interactions of various individual, organizational and professional values, needs and experiences over time (Bronfenbrenner, 1981; Homans, 1950; Schroder and Suedfeld, 1971). Together, these interactions create "an epistemic community" (Holzner and Marx, 1979), a "professional and organizational culture" (Badura and Waltz, 1980) in which norms, values, and expectations of professional growth and knowledge use emerge, develop and transform each other. We have borrowed from S. Boocock and others in naming this the "Social Context of Staff Development" (Boocock, 1973; Platt, 1979).

In examining participant-initiated staff development programs, particularly those conducted through inservice, it is apparent that this "Social Context" also serves as the setting for the inservice workshop. The workshop therefore becomes an event which is shaped by, and in some small measure helps shape, the larger social context. The impact of the workshop, all other things being equal, will vary from setting to setting. Furthermore, we predict that the workshops

themselves will respond to economies of scale and utility.

In summary then, we have conceptualized an environment or context for staff development in which three sets of variables are present: individual background, characteristics and experiences; organizational characteristics and climate; and inservice workshop features. While each of these variable sets will be discussed below, it is important to remember that they are interactive and interdependent. Together they create a social context in which staff development and knowledge use for improved educational practice can occur.

The Knowledge Use Process

Recent research has focused not only on trying to explain the low rate of diffusion and adoption of innovative programs, but also the low use of "knowledge", more broadly defined to include: ideas, information, skills, experience, activities and behavior (Chin, 1980; Larsen, 1980). Several authors have suggested that knowledge use is a far more complex process than that associated with the "pipeline" or research-development-diffusion model discussed by Rogers (1962), Guba (1967), and Guba and Clark (1975). Holzner and Marx (1979) recognized that knowledge utilization in schools is governed by complex interactions of factors associated with the knowledge itself. Robert Rich and others (1981) have further indicated that knowledge utilization is a complex process involving several discrete, interdependent stages.

The first part of this study, follow-up interviews, and subsequent research lead us to hypothesize that there are at least three general stages in the knowledge use process: knowledge acquisition, knowledge application, (use and impact), and continued use (adoption) or adaptation of knowledge. Each of these stages is

dependent, in some way, upon the previous stage. Therefore, the amount of knowledge that is utlimately adopted or adapted by the practitioner will depend on the amount of knowledge applied, and its impact. The amount of knowledge applied, in turn, will depend upon what knowledge has been acquired, in this case, through the inservice experience.

Knowledge Acquisition: By knowledge, we mean: information (ideas), skills (techniques), activities (technologies), attitudes and behaviors. As a learning experience, each inservice workshop has the potential for the dissemination and acquisition of knowledge. Knowledge dissemination is the act or means of imparting information, etc., and knowledge acquisition is the act or process by which knowledge is gathered or received. While they are interdependent, they are not necessarily equal. In any transaction, the "cup and the lip" theory is often the rule rather than the exception. Therefore, while many researchers have concentrated on dissemination-diffusion, we believe that dissemination is only half of the story. The Knowledge Use Process begins with acquisition, and depends on the readiness and capacity of the workshop participant, the ultimate user of this information. Thus, to repeat, knowledge acquisition is the act or process by which individuals gather or receive information, skills and behaviors.

Experience and research indicate that only a part of the inservice workshop will deal with the dissemination and acquisition of substantive knowledge. The remainder involves processes which either facilitate or inhibit Knowledge Acquisition. Therefore, every inservice workshop experience has several elements: the acquisition substantive knowledge (we have labeled these the Amount Learned variables); and dissemination or interaction processes--specific methods and techniques,

which accompany knowledge acquisition (we have labeled these the How Learned variables). The *amount of knowledge learned*, and *how it is learned* will result in workshop participants acquiring some New Knowledge, as opposed to renewed or reviewed knowledge. Finally, the workshop will create a general effect or impression on the participant which we have called the Inservice Rating.

Therefore, for the purpose of this study, we have developed a set of variables which we have labeled Knowledge Acquisition:

- Amount Learned: participant ratings of the amount of knowledge they acquired from the inservice workshop in each of 14 areas.
- How Learned: participant ratings of how much information was acquired through each of 12 specific methods or techniques.
- New Knowledge: participant ratings of the new knowledge they acquired from their inservice workshop in five areas: information, skills, behavior, activities, and attitudes.
- Inservice Rating: participant ratings of the overall successfulness of their completed inservice workshop.

Knowledge Application (Use and Impact): An important part of the knowledge use process is application, that is whether or not information, skills, etc. are applied to the participants' own setting. Clearly, if there is no application it is likely that knowledge acquired from the inservice experience may soon be lost or fall into some state of disuse. We have labeled this important aspect of application Knowledge Use.

An important assumption underlying *knowledge use* is that the more knowledge is used, the more likely it is that it will result in changed practice and learning impacts. Thus, the application of knowledge (new or renewed) will affect participants' estimates of the impact of using inservice-acquired knowledge on their own

work environment at various levels: their classroom, their grade or department, their school, and the community. We labeled these effects collectively as Work Impact. The inservice experience and the act of applying the knowledge may also affect the participant in more subtle ways. Indeed, the workshop and related experiences with knowledge use may affect the participants' outlook, needs and relationship with self and others. The resulting "feeling" may promote or inhibit participants' attitudes about knowledge use and professional development. Herb Simon referred to this type of outcome vis a vis as "psychic inventory" (19). We have labeled these as influences (positively or negatively) on Work Capacity.

Finally, the inservice workshop experience, the process of acquiring knowledge, and the effects (substantive or psychological) of applying knowledge will leave the participant with an inclination to use or not use workshop acquired knowledge in the future. We have called this inclination (or disinclination) Predicted Use.

Therefore, we have developed a set of variables associated with Knowledge Application that may be summarized as follows:

- Knowledge Use: participants ratings of how often they used knowledge acquired from their inservice workshop.
- Work Impact: participant ratings of the impact the inservice workshop had in 12 areas of their work environment ranging from their personal life and certain students in their class to the community in which their school is located.
- Work Capacity: participant ratings of how their inservice workshop experience has affected their non attitudes, and behaviors regarding aspects of the interpersonal work environment in 9 areas.
- Predicted Use: participant ratings of the likelihood that they will use or continue to use knowledge acquired from their inservice in the coming school year.

Continued Use and Adaptation: An important part of the knowledge use process, especially as it relates to the improvement of educational practice, concerns what happens to knowledge acquired through inservice workshop over a period of time. Such knowledge may be adopted by the practitioner and put into Continued Use from one year to the next. Several authors have suggested that knowledge may go through a transformation, personalization or other form of Adaptation as time passes (Berman and McLaughlin, 1978; Campeau, et. al., 1978; Larsen, 1980). Furthermore, the continued use or adaptation of knowledge may relate to the propensity for Future Use of knowledge. Does knowledge acquired from inservice workshops have a half life? Does it fade? Does it go through a transformation? What factors are associated with this part of the knowledge use process?

To examine these questions, we developed a set of three variables:

- Continued Knowledge Use: participant ratings of the frequency with which they used knowledge gained in their inservice workshop over a six month period.
- Adaptation: participant assessments of the degree to which the altered or adapted knowledge gained from their inservice workshop over a six month period.
- Future Knowledge Use: participant ratings of the likelihood they will use inservice acquired knowledge during the coming year.

In summary then, we have conceptualized a three-stage knowledge use process represented by three sets of variables: 1) Knowledge Acquisition, consisting of the amount learned, how learned, new knowledge, and the inservice rating; 2) Knowledge Application consisting of Knowledge Used, Work Impact, Work Capacity, and Predicted Use; and 3) Continued Use or Adaptation of knowledge including continued use, adaptation, and future use.

The Revised Conceptual Model

As stated above, follow-up interviews and research suggested that we revise and refine our conceptual model to explain the association between inservice programs and knowledge use in terms of interactions between the Social Context of Staff Development, and the various stages of the Knowledge Use Process. Figure 3, below presents an illustration of the revised conceptual model.

Insert Figure 3 about here

Simply stated, the model represents a multi-staged path diagram which is interactive, iterative and time dependent. The variable sets on the left side represent control variables such as staff background and characteristics, and independent variables such as organizational climate and inservice workshop features. These variable sets constitute the Social Context of Staff Development. The variable sets on the right side represent both dependent and intermediate variables. Since the model is based on the hypothesis that there is some causal association in the process of Knowledge Use, Knowledge Acquisition is a dependent variable set in its relation to the Social Context and serves as an intermediate variable in its relationship to Knowledge Application and Continued use. Similarly, Knowledge Application is dependent in relation to the Social Context and Knowledge Application, but functions as an intermediate variable in its association to Continued Knowledge Use and Adaptation.

Operationally the model explains the extent to which the Social Context relates to the various stages of the Knowledge Use Process over time. Since the type of inservice examined is teacher or participant initiated, the inservice workshops are considered, in part, an extension of the Social Context. Teachers participating in

the inservice workshop will acquire, apply and continue to use or not use knowledge within a specific social environment.

The model assumes that over time, factors associated with each stage of the Knowledge Use Process may change. Thus, while inservice workshop features and consultant behaviors may provide the strongest correlates of knowledge acquisition, organizational climate may be more strongly associated with knowledge application, and individual characteristics may be strongly related to continued use and adaptation. Finally, while the model seeks to explain the relationship between individual, organizational and workshop characteristics and the Knowledge Use Process, it also attempts to illustrate how knowledge use, itself a multi-staged sequence of processes, unfolds and changes over a period of time, feeds back into the Social Context and creates future expectations and needs for staff inservice.

In the analysis and discussion that follow, we will attempt to explain:

- the relationship between various factors that together constitute the Social Context of Staff Development.
- the relationship between Social Context of Staff Development and Knowledge Acquisition.
- what factors and conditions in the Social Context are most significantly associated with Knowledge Application.
- what factors and conditions in the Social Context are most significantly related to the continued use, adaptation and future use of inservice-generated knowledge.
- how the various steps of the Knowledge Use Process relate to and influence each other, and
- how the Knowledge Use Process relates to the Social Context of Staff Development through Inservice.

Method

Three questionnaires were developed for the second phase of the study: a 17 page, 226 item pre-inservice questionnaire; a 13 page, 154 item post-inservice questionnaire; and a 2 page, 25 item follow-up questionnaire. The pre-inservice questionnaires were administered to 460 teachers participating in 36 different in-service workshops prior to their first workshop session in the early spring of 1982. These questionnaires were encoded with an individual identification number. The post-inservice questionnaires were encoded and mailed to the 460 participants two weeks after the conclusion of their inservice program in the late spring of 1982; 349 people returned both questionnaires.

Six months after the completion of the inservice workshops, (December 1982), the 349 pre-post respondents reviewed a two-page follow-up questionnaire. These questionnaires were encoded with the participants' individual identification number so that their follow-up responses could be matched with their pre-post inservice questionnaires. A total of 235 participants representing 34 inservice workshops completed all three questionnaires. Participants and workshop organizers (conveners) received a small honorarium for completing the questionnaires. The following analysis and discussion are based on these responses.

As discussed above, the phenonmenon of knowledge use resulting from staff-initiated inservice workshops is viewed as a series of interactions between two variable groups: Social Context Variables, and Knowledge Use Process Variables. Each of these two groups is composed of several sets of variables as illustrated in Figure 3, p 13.

The 235 participants' responses to the three questionnaires were subjected to correlation and regression analysis. A correlation matrix was created using Pearson's

product moment coefficients. This matrix provided the basis for all subsequent analyses. Due to the extensive number of items (405), many of them were collapsed into composite scales. Correlational, factor, and reliability analysis supported the assignment of these sets of items to scales; examples include personal traits, school climate variables, and various outcome variables. In all cases where composite scales are used, the internal consistency reliabilities are high to moderately high. A few scales, such as Individual learning style are only marginally robust (See Table 1). However, the reliabilities of the outcome variables are extremely high (See Table 4).

Because of the large number of variables (211) and the number of subjects (235), canonical correlation procedures are used to minimize co-variation, and limit the occurrence of chance exploitation of significance. In the following analysis, the two variable groups are divided into three variable sets. Each set is analyzed in relation to every other variable set using canonical procedures.

The items and composite scales included in the group of Social Context Variables are presented in Tables 1 through 3 below. Table 1 shows the items and scales for the set of variables labeled staff background and characteristics (A variables). This variable set is divided into four subsets: staff background (subset A_1); staff professional and psychological traits (subset A_2); staff inservice needs (subset A_3); and staff experiences (subset A_4). Table 1 provides the means, standard deviation, percents, range and composite scale statistics including internal reliability alphas for all items in each of the variable subsets.

Insert Table 1 About Here

Table 2 shows items and composite scales for the set of variables labeled school characteristics and climate (B variables). This set is divided into three subsets: school characteristics (subset B_1); school climate (subset B_2); and inservice support (subset B_3). As with Table 1, Table 2 presents response means, standard deviations, etc. for individual items and composite scales in this variable set.

Insert Table 2 About Here

Table 3 shows the individual items and composite scales for the third set of Social Context Variables, inservice workshop characteristics. This variable set is comprised of two subsets: Inservice Workshop Features (subset C_1); and Consultant Characteristics (subset C_2). Table 3 also provides response means, standard deviations, percents, ranges, and composite scale statistics for all items and scales comprising the inservice workshop variable set.

Insert Table 3 About Here

The variables associated with the Knowledge Use Process are described on pages 7 to 12 above. With the exceptions of Inservice Rating, each of these variables are composite scales. Table 4 shows the items and composite scales comprising the Knowledge Use Process Variable group. These 13 variables are divided into three sets: Knowledge Acquisition (D variables); Knowledge Application and Impact (E variables); and Continued Knowledge Use and Adaptation (F variables). Table 4 presents the response means, standard deviations and internal reliability alphas for each scale, as well as the means and standard deviations for all items comprising that scale.

Insert Table 4 About Here

Sample Characteristics

Table 1 shows that about 77% of the 235 participants in this study are women. The sample represents a wide range of education, professional experience, and longevity in their present school districts and schools. Almost 84% of the sample are classroom teachers; and 12% are specialists of various kinds. The majority of those in the sample (58%) live outside of the towns in which they teach. On average, the participants in this study took 5 credits of college or university instruction between 1980 and 1982. For the same period, they had an average of 9 days of inservice training from various sources. At the time the follow-up data were collected, (December, 1982) less than 30% (70) were currently involved in a staff inservice program.

Table 1 shows that the participants in this study have a strong preference for learning through concrete experience and active experimentation, as indicated by their responses to the Learning Style Inventory (Kolb, 1976). Similarly, Table 1 also indicates that participants express a preference for learning situations involving hands-on activities and application of information in their own classrooms. The area of greatest professional concern and involvement for these educators is their immediate, operative environment: their students, classroom, or departmental unit (Table 1). Participants indicated that their greatest professional needs involve learning how to motivate students to achieve; acquiring new teaching methods, increasing their professional self-awareness; and working more effectively with gifted students (Table 1).

School and Community Characteristics

As indicated by Table 2, the majority of the sample described their classrooms

as moderate to large in size, of average to below average ability, and relatively crowded. They described their communities, on average as blue-collar, friendly, non-urban, and residential (Table 2a).

Inservice Workshop Characteristics

Table 3 shows that over 80% of the sample attended workshops in one of four areas: Computer Assisted Instruction (35.4%), Basic Skills Instruction (24%), Special Education (18.9%), and Instruction of Gifted and Talented (11.1%). The majority (84.4%) indicated their involvement in the inservice was voluntary. The 34 workshops examined in this study range from 2 full-day sessions, to 20 two-hour sessions. The average workshop consisted of approximately 9 one and one-half to two-hour sessions. Workshops involved from 8 to 60 participants. While the majority of workshops engaged only one consultant, several had as many as 8 or 9 different consultants over the course of the inservice. Over 78% of these consultants came from either a college or university (28.4%), another school system (27.5%), or from the same school system as the participants (23.2%).

Knowledge Acquisition and Use Characteristics

Table 4a shows that participants indicated that, on average, the areas in which they acquired the most knowledge were: new or varied teaching methods/technology motivating students, new subject matter, and increased professional self-awareness. They learned least about: interracial attitudes, dealing with disruptive students, and providing guidance to students. They also indicated that the methods most used for acquiring knowledge were: lectures, engaging in hands-on activities, engaging in discussions with other participants, and practicing skills or behaviors; viewing A.V. presentations rated lowest. Table 4a also indicates that, the types of new knowledge most often acquired were information (ideas) and skills (techniques).

Generally, participants rated the acquisition of new behaviors lowest.

Table 4b shows that, on average participants applied information (ideas) and skills (techniques) most frequently, while activities (worksheets) were least frequently used in the period immediately following the conclusion of the inservice workshop. Participants judged that their own teaching and that of close fellow staff members were most affected by the inservice experience; the activities of their professional association or union were least affected. In terms of influencing their work capacity, participants generally felt that the inservice workshops had enhanced their abilities to create challenging and effective learning experiences for students most; and least noticeably increased their capacity to influence fellow teachers and administrators concerning important school matters. Table 4b also shows that, at the conclusion of their inservice experience, participants predicted that they were most likely to use information (ideas) and skills (techniques) in the coming school year, while they were least likely to use activities acquired from their inservice in the future.

Table 4c shows that staff did tend to use activities from their inservice workshops least. On the other hand, they indicated that attitudes acquired from their inservice were more often used than were information and skills. Participants generally did not tend to adapt the knowledge acquired from their inservice experiences. They were most likely to adapt activities for use in their own settings and least likely to adapt information. Finally, Table 4c shows that participants were consistent in their predictions of the types of inservice-acquired knowledge they would use in the future. As with Predicted Use (see Table 4b, page), participants indicated that they were most likely to use information and skills over time, and least likely to use inservice acquired activities in the future.

In summary, the types of knowledge most often acquired through and applied from these inservice experiences are information (ideas) and skills (techniques). The types

of knowledge that are most frequently subjected to continuous use are inservice-acquired attitudes and information. In all cases, activities (worksheets, exercises) disseminated through inservice workshops are least often acquired or used. While activities are used infrequently, they represent the type of knowledge most likely to be adapted for use by inservice workshop participants.

Results and Discussion

As mentioned above (page 16), the 211 items and scales from the three questionnaires were placed into six variable sets: three sets of control and independent variables (sets A through C), comprising the Social Context of Staff Development; and three sets of dependent variables (sets D through F), treated as intermediate effects and outcomes representing the Knowledge Use Process. These variable sets were subjected to correlational analysis using canonical procedures and regression analysis. The results of these analyses are reported below. The discussion is presented in six parts: 1) The Social Context of Staff Development, associations among the three sets of independent variables (A through C); 2) Knowledge Acquisition, associations between the Social Context variable sets and the Knowledge Acquisition Variables (sets A through C with F); 3) Knowledge Application, correlations between the Social Context variable sets and the Knowledge Application and Impact variable set (A through C with E); 4) Continued Knowledge Use, relations between the sets of Social Context variables and the set of variables measuring Continued Use and Adaptation of knowledge (sets A through C with set F); 5) The Knowledge Use Process, associations among the three sets of dependent variables (sets D through F); and 6) Knowledge Use Through Staff-Initiated Inservice, a summary of the key factors and conditions that are associated with the utilization of knowledge acquired through inservice workshops (associations between variable sets A through F).

The Social Context of Staff Inservice

Three variable sets constitute the Social Context of Staff Inservice: Staff Background and Characteristics (A variables); School Characteristics and Inservice Climate (B variables); and Inservice Workshop Features (C variables). Correlation among these sets of independent variables indicate that together, they do represent a psycho-social environment in which the major components are strongly interrelated. Figure 4 below shows the correlations among the three social context variable sets using canonical procedures. Analysis indicates that there are at least three arrangements or groupings of variables between each of the sets which are significant at the .05 level.

Insert Figure 4 About Here

Staff Background and Characteristics (A) are most powerfully related to the other two variable sets, School Climate (B) and Inservice Workshop Features (C). Canonical correlations between the set of staff background variables and school climate variables (A and B) indicate that there are five groupings of these two variable sets that are significant at the .05 level. The first arrangement has a correlation of .95 (adjusted) and is significant at the .001 level. In this arrangement, the most powerful associations are between the following variables: female participants who reside outside of their school district, and who have experienced success using knowledge acquired from inservice workshops; with school characteristics such as teaching in residential, white collar communities with small classes, high expectations on staff and students, where knowledge acquired has matched the needs of the students, and where fellow staff members are supportive, and supervisors expect teachers to use new knowledge in their practice. Other arrangements of variables that are highly correlated and significant are:

Staff Background (A)		School Climate and Characteristic (B)
· older staff and high levels of job satisfaction	with	· small, spacious classrooms, positive school inservice climate (Table 2a), satisfying classes and a unified, active, effective, interesting, friendly, democratic and cooperative school.

In this arrangement the correlation is .95***(adjusted). We have labeled this the "Happy School" model.

· staff with needs for power and achievement with supervisors, a positive personal life, who are motivated by the needs of their students and their interest in the inservice topic	with	· high job needs, negative school climate (Table 2b), and negative events in the classroom and at the school and community level.

This grouping of variables has a correlation of .94***. We have labeled this the "Insular Classroom" model.

· staff assured of their current jobs, having school-wide concerns, who like to learn through observing others, and a positive personal life	with	· classes of high-ability students, positive events in the school and community, low expectation for staff and students

This arrangement of these two variable sets has a correlation of .93***.

In examining the correlation between the Staff Background variables (A) and Inservice Workshop Features (C), there are four groupings of these two sets which are strongly and significantly related.

Staff Background (A)		Inservice Workshop Features (C)
· classroom teachers who had high levels of attendance and interest in inservice workshops taken for low-cost no-cost professional credit	with	· Computer Assisted Instruction workshops with several sessions involving hands on application with the computer.

This arrangement between the two sets has a correlation of .95***(adjusted). It is the "Computer Literacy" Model.

· Staff who frequently attend inservice programs, have high levels of job satisfaction, are motivated to grow professionally and who have had positive experiences with inservice workshops	with	· voluntary, open inservice programs run by visiting university consultants who are effective, practical instructors, who visit the participants' classrooms and have them apply the knowledge to their own settings as part of the inservice workshop itself.

This grouping has a correlation of .85***, and after several site visits we have labeled this the "Effective Inservice Program" model.

· specialists who take college/ university courses, do not like doing written assignments and who have had success in applying newly acquired knowledge to their own settings...	with	· Inservice workshops on gifted and talented instruction which have fewer than 18 participants. Consultants tend to come from other school systems and are effective instructors, good discussion leaders. They encourage participants to apply inservice acquired knowledge to their classrooms.

This grouping has a correlation of .79**.

· generally all staff background variables are equally (moderately) associated...	with	· Basic Skills and student discipline workshops that are voluntary and involve a single school. The consultants are generally from the same school system, use discussions frequently but are not highly effective instructors.

This arrangement of the variables in the two sets has a correlation of .76**. We have entitled this grouping the "Inhouse, Getting Back to Basics" model.

Figure 4 indicates that there are only two groupings of canonical correlations between the set of School Climate variables (B variables) and Inservice Workshop variables (C variables) which are significantly related. Interestingly, the two variable arrangements represent very different types of schools and communities and two very different sets of inservice workshop features.

School Climate (B)		Inservice Workshop (C)
· prosperous, residential, white collar communities, with positive school climate regarding equal treatment, and support for staff development, focusing on the needs of the students	with	· "other" types of inservice (usually staff concerns and innovative practices) with relatively few sessions (6 or less). The consultant is usually from a college, requires no written assignments and conducts lectures/discussions on practical, useful topics.

The canonical correlation between these two variable sets is .75***. This is called the "Affluent School" model.

· urban , blue collar school system where staff need inservice credits, the system has a poor reputation for presenting inhouse staff development programs	with	· voluntary participation in workshops involving eight or more sessions, which result in inservice credits for participants. The consultant comes from the same school system and is an effective discussion leader.

The association between this grouping of variables is .74**. We have labeled this the "Urban Insiders Inservice"model. Staff require formal incentives and prefer people (consultants) they know and trust.

In summary, staff background and characteristics provide the basis for the other variable sets in the Social Context of Staff Development. There are a total of 11 significant canonical groupings among these three sets of Social Context variables, nine involving the Staff Background (A) variable set. There are only two significant arrangements, canonically speaking, between the School Climate (B) variables, and the Inservice Workshop (C) variables, the "Affluent School Inservice"model and the "Urban Insiders Inservice" model.

Knowledge Acquisition (and workshop effects)

Canonical Correlations between the Social Context variables group (A-C) and Knowledge Acquisition (D) variables indicate that there are only two significant groupings of these variables. However, Figure 5 also indicates that there are 19 arrangements between the individual sets of Social Context variables (A,B and C) and the set

of Knowledge Acquisition (D) variables that are significant at the .01 level or greater. Thirteen (13) of these correlations involve the Inservice Workshop (C) variable set.

Insert Figure 5 About Here

Since it would be too cumbersome and tedious to identify all 19 significant canonical groupings of these variable sets here, we will present only those items from each of the three of Social Context variable sets which are most strongly related with the acquisition of New Knowledge and enthusiasm for Future Inservice workshops (canonical correlations of .16 or greater).

New Knowledge	Future Inservice
Staff Background (A) Variables (Table 1)	
· Staff with more years in the school	· consistently high levels of job satisfaction over time
· high participation in inservice training programs	· participate in inservice workshops out of interest
· low needs for power over and affiliation with supervisors	· high expectations of the inservice workshop
· high interest in sharing ideas with colleagues	· success in using inservice acquired knowledge
· high expectations of the inservice workshop and mechanism (CII)	· knowledge gained from the inservice complements their own teaching style
· successful experiences in using inservice acquired knowledge	
· knowledge gained from the inservice complements their own teaching style	

There are three significant arrangements between the Staff Background (A) and Knowledge Acquisition (D) variables: with canonical correlations ranging from .88*** (adjusted) to .76** (adjusted).

New Knowledge | Future Inservice

School Climate and Characteristics
(Table 2)

- schools which motivate teachers to acquire new skills
- offer successful inhouse inservice programs
- schools described as effective
- schools which encourage and support knowledge use
- supportive, friendly communities
- administrators place high expectations for professional and student learning
- positive learning orientations
- classes which tend to be satisfying and democratic
- schools that are interesting

There are three arrangements between the School Climate (B) variables and Knowledge Acquisition Variables (D) which are significant. They all have canonical correlations of .66 and two are significant at the .001 level and one insignificant at the .01 level.

Inservice Workshop Features
(Table 3)
with New Knowledge AND Future Inservice

The Consultant:

- tends to come from within the same or a similar school system
- style matchs or complements the participants learning style
- was effective over a broad range of instructional behaviors
- uses specific methods such as:
  - encouraging discussion among participants
  - engaging them in hands on activities
  - project and activity development
  - having participants observe and practice the use of new skills, etc.
  - visiting participants classrooms
- uses methods that focused on practical (vis a vis theoretical) knowledge

In addition to the above items, two features are strongly associated with how participants acquired knowledge and how much they acquired. These workshop features are:

- number of sessions (generally between 8 and 12), and
- workshops which required participants to apply inservice-acquired knowledge in their classes and report back on the effects.

As we mentioned above, canonical correlation analysis of Inservice Workshop (C) variables and Knowledge Acquisition (D) variables identified 13 groupings of these variables which are significantly related. Twelve (12) of these arrangements are significant at the .001 level or greater and have canonical correlation ranging from .92*** to .59*** (adjusted). This analysis indicates that, of the 34 inservice workshops examined, at least 12 paths or models that are significantly related to New Knowledge Acquisition have been identified. In terms of structuring inservice workshops therefore, there are many different approaches and experiences that can lead to the acquisition of New Knowledge.

Insert Figure 6 About Here

Knowledge Application and Impact

Figure 6, shows that there is only one arrangement between the group of Social Context variables (A-C) and the Knowledge Application and Impact (E) variable set which is significant at the .01 level. This arrangement however has an extremely high canonical correlation of .98*** (adjusted). An examination of the canonical correlations between the individual Social Context variable sets (A, B, and C respectively), and the set of Knowledge Application indicates that only one significant grouping exists between the set of Knowledge Applications and Impact (E) Variables, and each of the three Social Context variable sets. Each of these groupings is summarized below. Those items and scales presented have canonical correlations of greater than .20 (significant at the .01 level).

Staff Background (A) Variables (Table 1)		Knowledge Application and Impact (E) Variables (Table 4b)
. the amount of inservice training received over the past two years . job satisfaction . learning through application . interest in the inservice topic . concern for students' needs . interest in sharing ideas with colleagues . interest in using the inservice acquired knowledge...	with	. Predicted Use . Knowledge Use (Application) . Improved work capacity

Canonical correlation of this arrangement of variables is.80***

School Climate (B) Variables (Table 2)		Knowledge Application and Impact (E) Variable Set (Table 4b)
. challenging school . supportive community . high expectations for staff and student learning . high levels of collegial and administrative support for use of inservice acquired knowledge, and . high expectations for knowledge use from supervisors	with	. Improved work capacity . Work Impact . Predicted Use, and . Knowledge Use (Application)

The canonical correlation associated with this grouping of the two variable sets is.62***

Inservice Workshop (C) Variables (Table 3)		Knowledge Application and Impact (E) Variables (Table 4b)
. inservice workshops which make knowledge application part of the workshop experience . consultants who are effective with a broad range of instructional behaviors . practical versus theoretical instructional techniques . use of lectures and readings . consultants who encourage participants to discuss their needs and experiences	with	. Knowledge Use (Application) . Predicted Use . Work Impact and . Improved work capacity

The canonical correlation between these two variable sets is .67***

It is important to point out that this analysis has identified only one grouping of Social Context variables that is significantly related to Knowledge Application. In examining Knowledge Acquisition (see pages 24 to 27, above) we found at least three sets of Social Context variables that were significantly related to the acquisition of New Knowledge, and 13 arrangements of inservice workshop (C) variables that were associated with Knowledge Acquisition. Here, we have only one; one arrangement of Staff (A), School (B) and Workshop (C) variables that is related to Knowledge Application and Impact.

Insert Figure 7 About Here

Continued Use and Adaptation

Unlike the other stages of the Knowledge Use Process, there are no significant associations between Social Context Variables (A-C) when analyzed as a group, with the Continued Use and Adaptation (F) variable set. Figure 7 shows that significant canonical correlations exist between the individual sets of Staff (A), School (B) and Inservice Workshop (C) variables and Continued Knowledge Use, but not between the Social Context of Inservice Variable Group (A-C) and Continued Knowledge Use (F) variables. In both cases, there are no significant associations between Knowledge Adaptation and any of the Social Context Variables.

Canonical Correlations between individual variable sets with Continued and Future Knowledge Use are summarized below. Each item or scale reported has a canonical correlation of greater than .20 (significant at the .01 level).

Staff (A) Variables
(Table 1)

- classroom teachers (negative)
- special education teachers (positive)
- teachers who learn through applying knowledge
- concerned about students' needs
- interested in sharing ideas with colleagues
- have had and continue to have success in using knowledge acquired from inservice workshops.

This grouping of the variables in these two sets results in a canonical correlation of .70*** (adjusted).

School Climate (B) Variables
(Table 2)

- schools with high expectations for professional and student development
- tendency to rate classrooms as democratic
- support from colleagues and administrators, and
- expectations of supervisors that inservice acquired knowledge will be used.

The correlation represented by this arrangement of School (B) Variables with Continued Knowledge Use = .61***.

Inservice Workshop (C) Variables
(Table 3)

- workshops focusing on Basic Skills and gifted and talented instruction
- workshops using consultants from colleges and universities and other school systems
- consultants demonstrated thorough knowledge of the topic, understand teacher's needs and concerns, and provide participants with new knowledge
- workshops which require teachers to put the knowledge into practice in their classes during the course of the inservice
- consultants assist teachers in the classroom in applying inservice related knowledge
- the consultant provides practical knowledge through encouraging discussions among workshop participants, developing and directing simulations or activities and other instructional methods that emphasize practical versus theoretical knowledge.

This grouping of workshop variables has a canonical correlation of .57*** (adjusted)

Insert Figure 8 About Here

The Knowledge Use Process

Figure 8 shows canonical correlations among the three sets of dependent variables: Knowledge Acquisition (D), Knowledge Application and Impact (E), and Continued Knowledge Use. Since these three stages were measured over a 10-month period of time, using three questionnaires, they are considered in a sequence: first, knowledge acquired; second, knowledge applied; and finally continued use of knowledge. The analysis of variable sets indicate that there are three significant groupings of knowledge acquisition variables that have correlations of .81***, .41*** and .41** respectively. There are only two arrangements between the Knowledge Acquisition (D) and Continued Use (F) variable sets. These have modest correlations of .57*** and .36*. In terms of Knowledge Application (E) and Continued Use (F) variable sets there are three significant groupings of these variables:

1. Knowledge Use Application and predicted use with . Continued use and future use (.60***);
2. Knowledge use (application) use, work effect and predicted use (all negative) with . Knowledge adaptation (.27***); and
3. Predicted Knowledge Use with . Future Knowledge Use (127***).

Insert Table 5 About Here

Table 5 shows simple correlations among the 12 intermediate and dependent variables examined in this study. The strongest associations exist between *How* Knowledge was *Learned* and New Knowledge, Continued Use and Future Use, and New Knowledge and Predicted Use. The weakest correlations are those between Adaptation

and all other dependent variables. There is also a strong chain of correlations between Knowledge Used (applied), and predictions of use, and Continued Use (.55***). Correlations between Predicted Knowledge Use (post-inservice workshop) and Continued Use (six-months later) are not as strong as (.44).

These findings suggest that the amount of New Knowledge Acquired from inservice is highly dependent upon the process through which it is disseminated and/or it is acquired (How Learned). Furthermore, *Knowledge Used* (applied), either during or immediately after the inservice workshop, is a better indicator of what will *continue to be used* than participant predictions of future use. Finally, the *knowledge that teachers continue to use* will shape their estimations of what *knowledge they will be using in the future*. When taken together, these associations strongly suggest that in inservice education, nothing promotes Knowledge Use more than using knowledge.

While several authors have suggested that effective knowledge use may require that the users "adapt knowledge to fit their own needs, or that there may be a mutual adaptation between user and producer" (Larsen, 1980, p. 428), Table 5 provides little evidence to support the first half of this assertion. By and large, few of the 235 participants in this study indicated that they had altered or adapted knowledge acquired from their CII-funded inservice workshops. In fact knowledge adaptation was negatively or negligibly associated with the other outcome variables.

On the other hand, Table 3(p.) and interviews with participants strongly suggest that mutual adaptation does occur between knowledge producers/(consultants) and knowledge users (teachers) in more effective inservice programs. This process of "educating the consultant" and "custom tailoring" the knowledge to fit the situation was frequently cited by participants and consultants as a reason why CII-funded programs were considered superior to other forms of inservice including University-based programs (See Table 1). Having consultants (knowledge producers) enter

the social context of practice, especially in visits to the participants classrooms, required them to adjust to the realities of the situation. This situational knowledge allowed the consultants and teachers to adapt themselves and the knowledge to the relevant setting. Thus, "mutual adaptation between user and producer" may indeed be a critical element in promoting knowledge use through inservice.

Insert Figure 9 About Here

Knowledge Use through Staff Inservice:

In this section, we present the revised conceptual model in its entirety. Figure 9 shows the canonical correlation of the group of Social Context Variables (A through C) as it interacts with the Knowledge Use Process. In this analysis, the Knowledge Acquisition (D) variable set is both dependent, in its relation to the Social Context, and independent, as it relates to Knowledge Application and Continued Use (E and F) variables. Since we have already discussed Knowledge Acquisition in its association with the Social Context (see pages 24 to 27), we will concentrate on the issue of Knowledge Use (application and continued use) here.

In the following section, we consider only those items (or scales) in each variable set with canonical correlations of .20 or greater. In this analysis, only one arrangement between the Social Context Variable Group and Knowledge Acquisition Variables (A through D) with Knowledge Application and Continued Use (E and F) Variables was found to be significant, having a canonical correlation of .99***. In this arrangement four dependent variables are more powerfully related to the Social Context variable group than are the others: Predicted Use (.92), Knowledge Used (applied) (.57), Continued Use (.40), and improved work capacity (.40).

Staff (A) Variables: Several staff variables are strongly related to the Knowledge Use Process. These are

- the amount of previous inservice training received
- level of interest in the inservice topic
- current job/skill requirements, and
- expectations (positive) of the beginning inservice

However, the strongest associations between Staff (A) and Knowledge Use (E and F) variables were staffs':

- prior and current success in using new knowledge, and
- perception of how much the inservice-acquired knowledge complements their own teaching style

These findings appear to support the study's hypothesis that Knowledge Use through inservice is an experiential, developmental process; a process where experience and success promote further growth, and unsuccesful experiences with inservice programs become a barrier to future participation. It affirms the notion of a cycle that, when positive, will generate further activity, and when negative, will inhibit future participation.

School (B) Variables: Only three school climate variables are found to be strongly related to use of inservice acquired knowledge. The strongest of these is

- *the needs of students at any particular point in time.*

Since teachers, in general, must deal with new student populations every year, these needs may radically change from one year to the next, providing an important parameter to continued and future knowledge use. The other two factors which appear to influence knowledge use are

- *the support received from colleagues and other staff, and*
- *the expectations of supervisors/administrators that the inservice acquired knowledge will be used.*

These associations suggest that professional support and administrative leadership play an important part in staff inservice and knowledge use over time.

Workshop (C) Variables: In examining workshop characteristics, five factors are powerfully associated with Knowledge Use. All of them refer to the consultants' characteristics and behaviors (see Table 3b), and have correlations with knowledge application and continued use of .32 or more. The two consultant characteristics with the strongest associations are:

- the *degree to which the consultant uses instructional methods which are practical and non-theoretical*, and
- the consultants *effectiveness across a wide range of instructional behaviors*, such as demonstrating expertise in the area, relating to participant, understanding teachers concerns and needs.

In addition, a *match between the consultant's presentation style and the participants learning style* appears to be important.

Finally, there is a strong and obvious relationship between the degree to which workshops promote or require that participants apply inservice-acquired knowledge to their own settings during the course of the inservice experience. These findings suggest that the use of inservice-acquired knowledge requires carefully structured, practical, relevant, focused and effectively-led workshop experiences. Inservice workshops must not only disseminate new and useful knowledge, but they must also succeed in creating and reinforcing linkages between the participants classroom and inservice workshop.

Insert Figure 10 About Here

On the basis of these findings and the foregoing analysis, we could represent the successful Knowledge Acquisition Process as a four-step process. Figure 10

shows how that process is likely to occur. Participants attend ongoing inservice workshops and are introduced to new skills, information and behaviors. They are encouraged to take this knowledge back to their classroom and apply it. At the next inservice workshop they report on their successes or problems and receive feedback from the consultant and other participants. Experiences are discussed, evaluated and Knowledge is augmented or refined and the process repeats itself.

This process conforms with findings from the first phase of this study which found that:

- single-school, multiple-session inservice workshops had a higher impact on participants' practice than single-session inservice programs
- workshops with too many participants inhibited individual's ability to relate and discuss their experiences in applying the knowledge.

Knowledge Acquisition (D) Variables: As figure 8 and Figure 9 show, knowledge acquisition is an essential stage in the Knowledge Use Process. In this analysis, all acquisition (D) variables were strongly associated with Knowledge Application and Continued Use. New Knowledge acquired (.59), and participants enthusiasm for furture inservice(.54) were most powerfully correlated with Knowledge use. This reinforces our previous assertion that a successful, positive inservice experience is an essential ingredient in promoting Knowledge Use, or simply put, nothing succeeds like success.

Summary and Conclusion

The findings discussed in this analysis appear to support assumptions that underlie the revised conceptual model (see page). As determined in this study,

Knowledge Use is a multi-staged, interdependent, iterative process that develops over time. In staff-inservice programs, it does draw from an interaction among Staff (A), School (B), and Workshop (C) variables which influence the various stages of the process. Finally, the Knowledge Use Process (acquisition, application and use) represents an experience which has substantive and psychological consequenses which relate to the participants' larger Social Context. It is a cycle which draws from and feeds back into a complex environment of individual, organizational and professional needs, values, and experiences.

In reviewing the Knowledge Use Process, one sees how the arrangements of Social Context variables change in their relation to each new stage of the process. A reexamination of figures 4 - 9 reveal that the associations of Staff (A) and Workshop (C) variable sets become weaker as the process proceeds over time.

On the other hand, the School Inservice Climate (B) variable set while initially weaker, retains its strength of association with each stage in the Knowledge Use Process. This finding suggests that organizational features such as the School Climate and Characteristics regarding inservice constitute a pervasive and stable element in the Knowledge Use Process.

While the influences of conceptual approach and methodology must be carefully considered here, this phenomenon appears to correspond to the notion of proximal and distal factors (Brunswick, 1956; Lewin, 1951). As the process of using Knowledge becomes more removed in time from the inservice workshop, and as the participant becomes involved in the complex environment of the school, the strengths of workshop (D) and staff (A) associations (influence) begins to fade. The school, as the focus of a series of organizational and professional values and constructs, appears to increase its proximity to each stage of the Knowledge Use Process. This interpretation suggests that further research is needed on the longitudinal effects of schools and organizational factors on Knowledge Use.

Clearly, the analysis presented in this paper in not exhaustive. It is broad and multivariate and provides a useful synthesis of sets of factors and conditions which have been found to affect Knowledge Use. These analyses are based on a small population of teachers who participated in 34 different workshops. While the general funding mechanism was similar (The Commonwealth Inservice Institute process), the workshop and schools involved represent a broad range of communities, institutions and inservice experiences. To some extent, the possible superiority of some school districts, methodological biases and constraints, the vagaries of time itself, and other ambiquities require that the findings presented above be considered thoughtfully and with reservation. The question of exactly where and how the Knowledge Use Process feedsback into the Social Context and what happens to inservice-acquired knowledge over the long term remain unanswered and will require careful, rigorous examination in the future.

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Table 1 Staff Background and Characteristics (A Variables)

Table 2 School Characteristics and Climate (B Variables)

Table 3 Inservice Workshop Features (C Variables)

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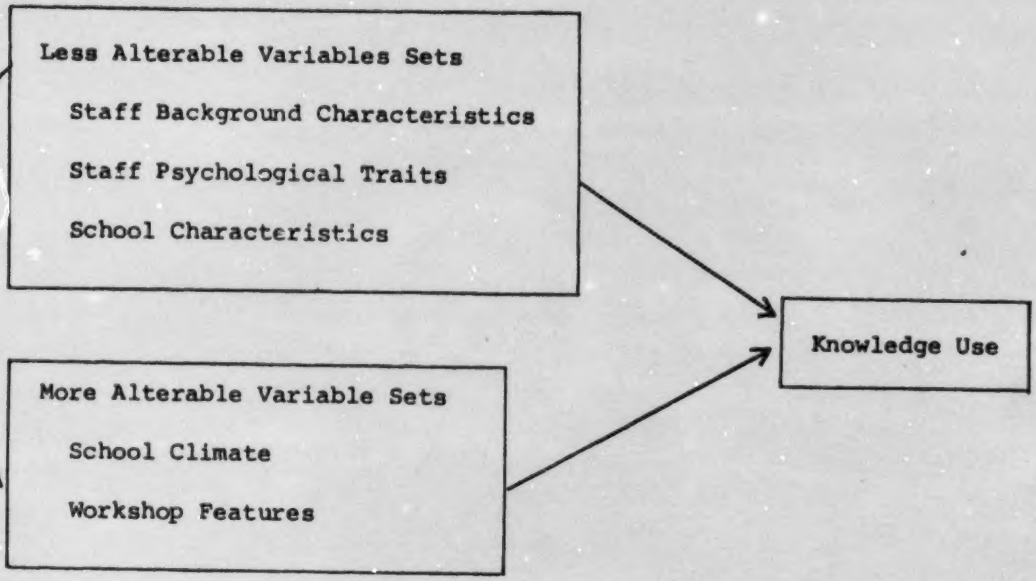

Figure 1: The original TDR Conceptualization of Knowledge Use Through Staff Inservice

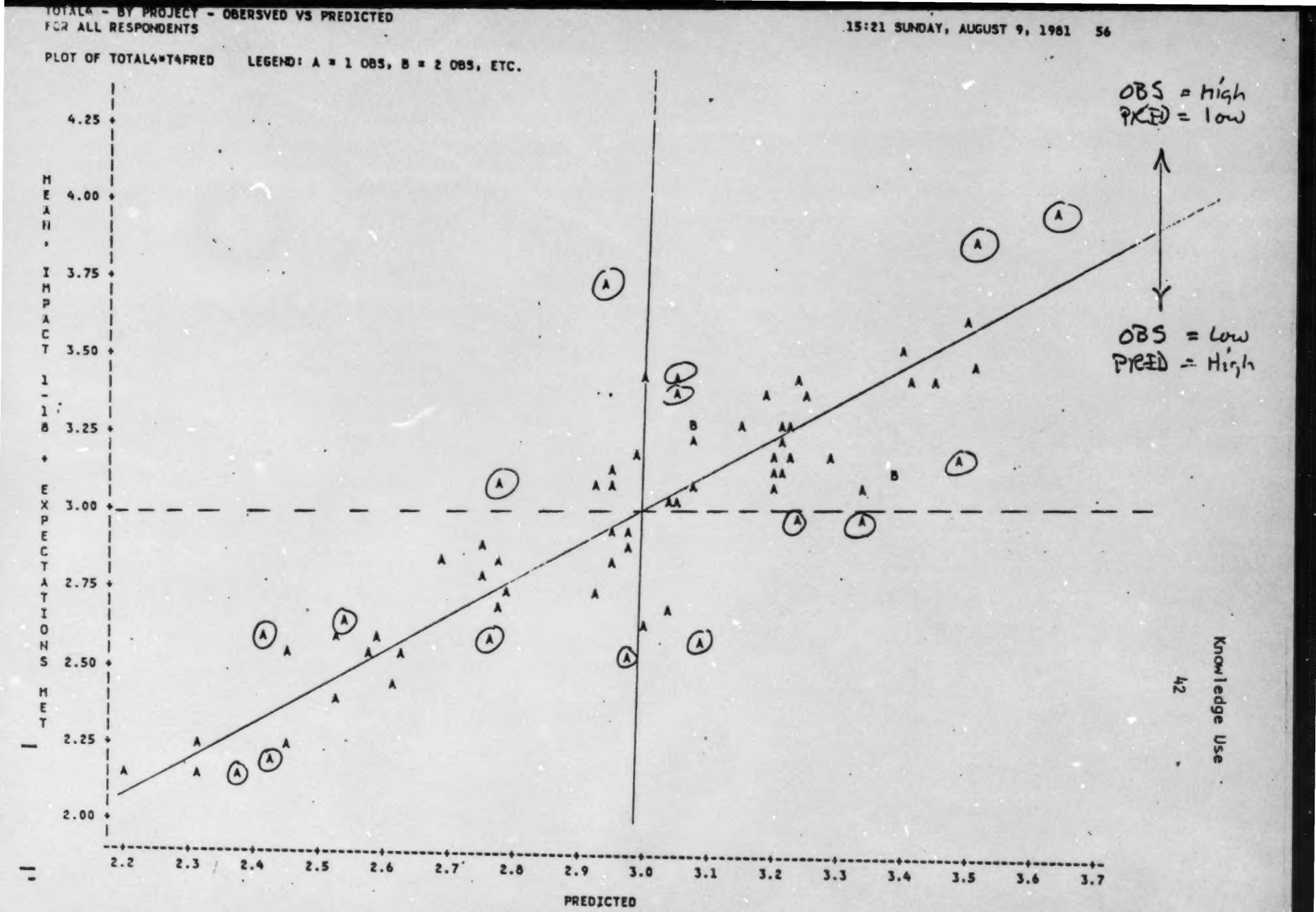

figure 2: Scatter Plot from Phase I follow-up analysis

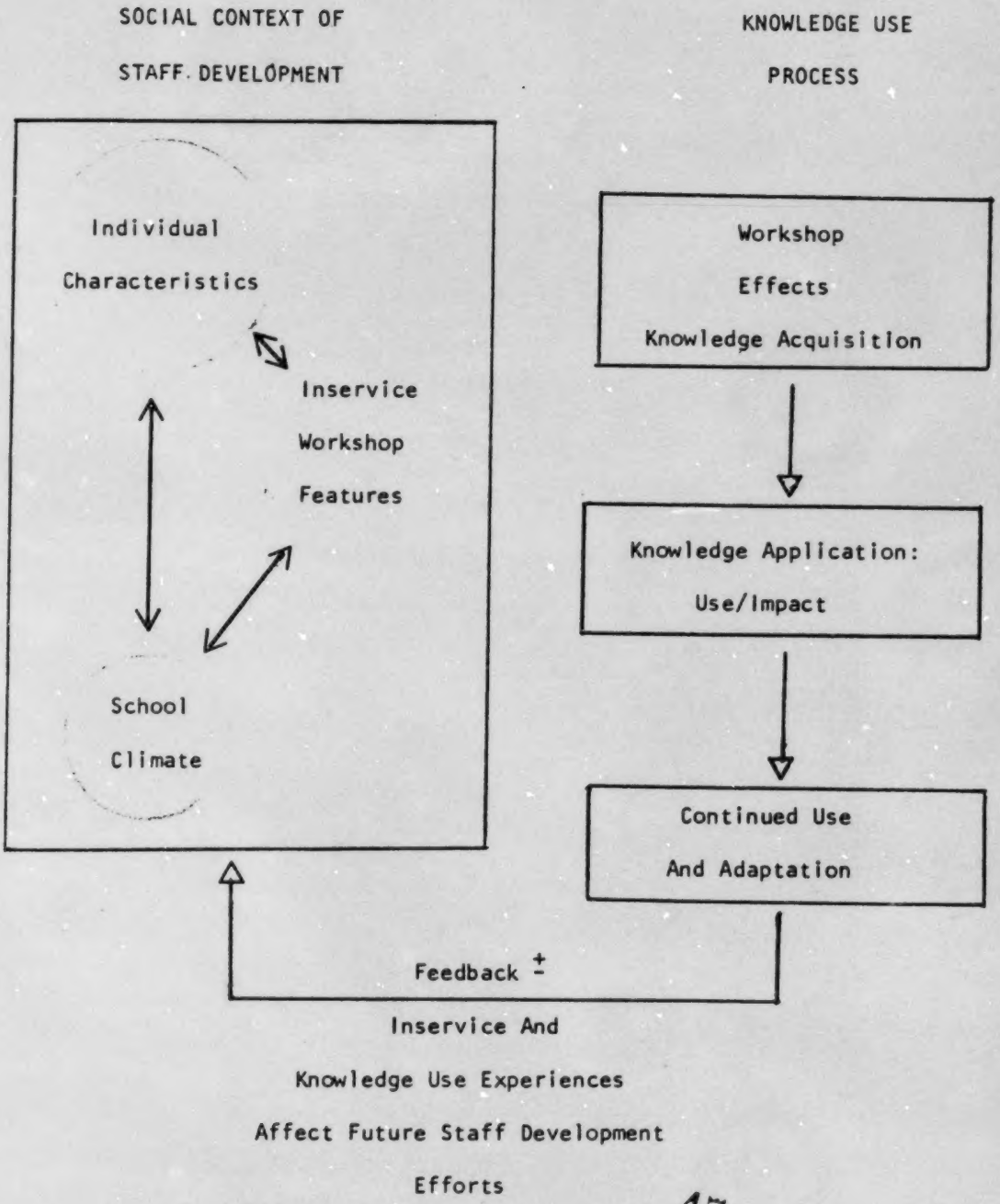

Figure 3: Revised Conceptual Model

THE SOCIAL CONTEXT OF STAFF INSERVICE

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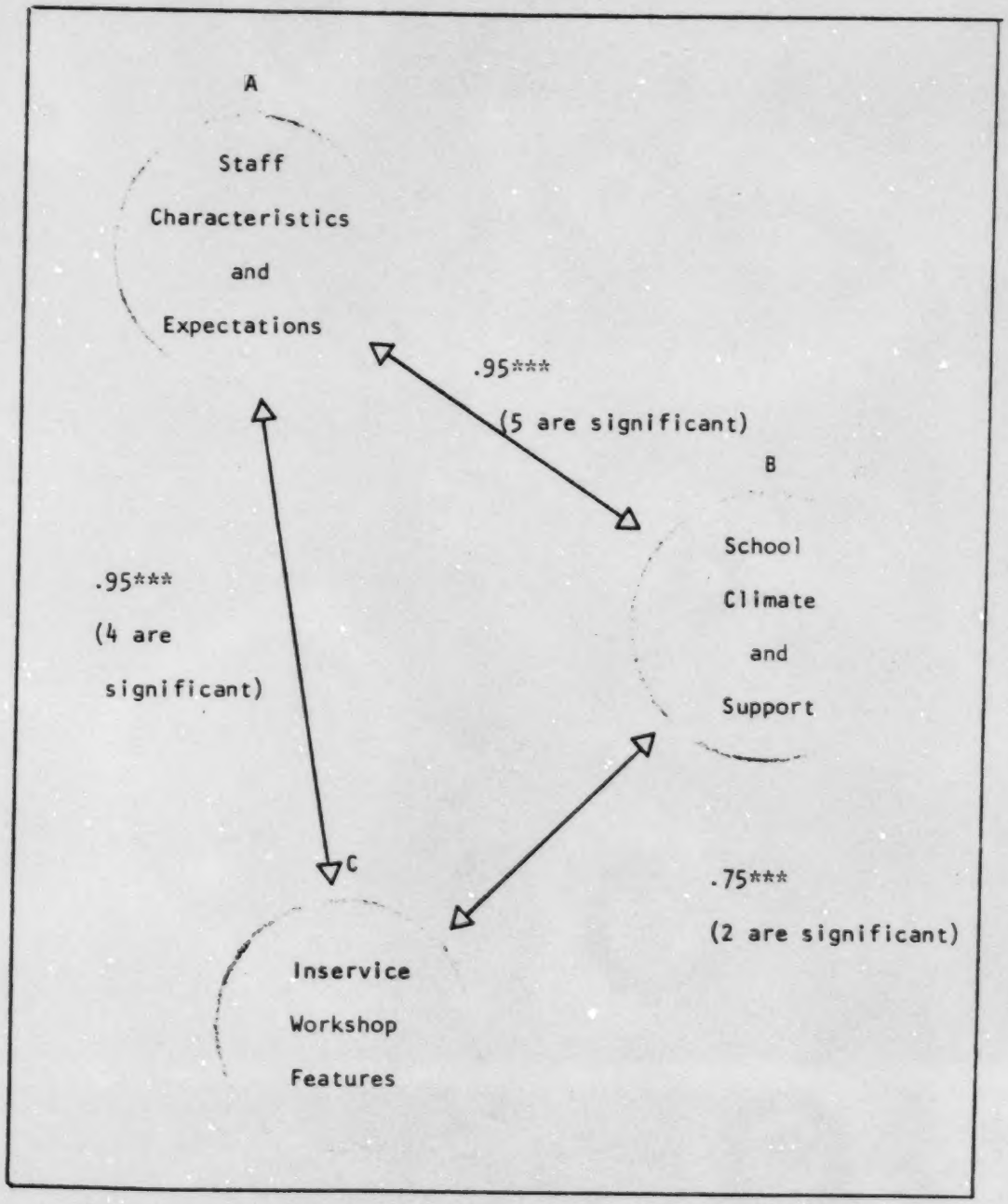


Figure 4: Canonical Correlations Among the Independent Variables.

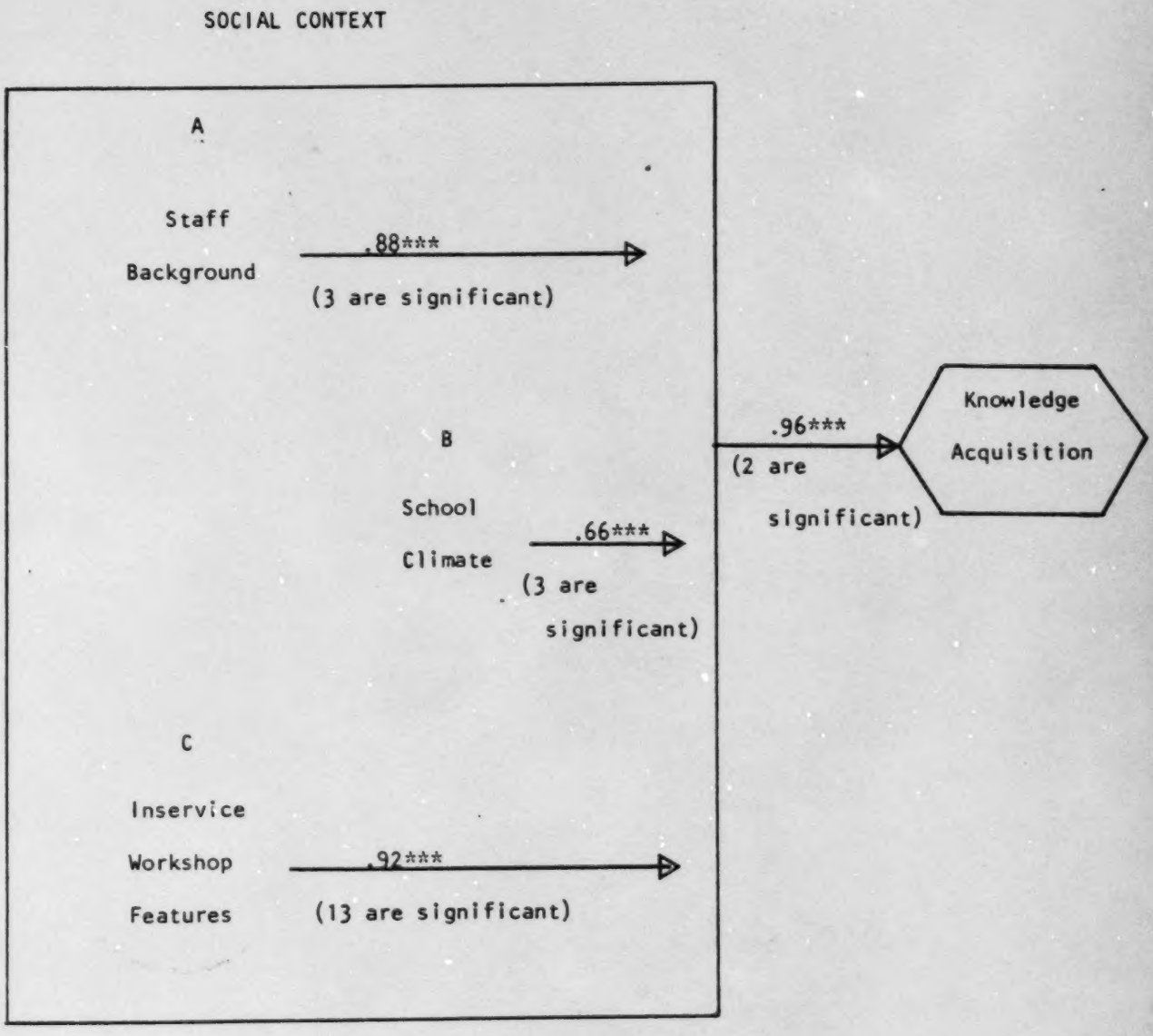


Figure 5: Canonical Correlations Between the Social Context Variables and Knowledge Acquisition Variables.

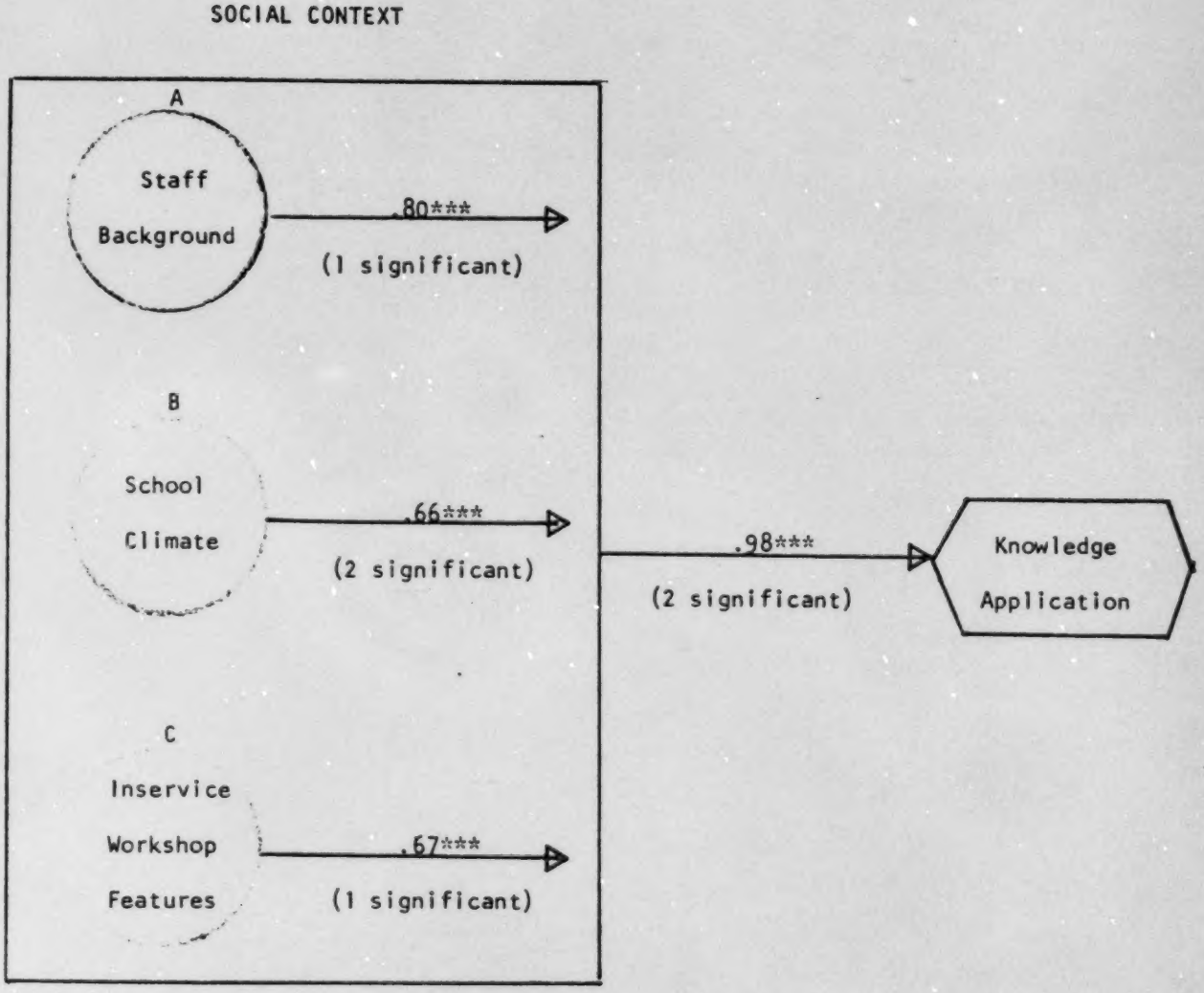


Figure 6: Canonical correlations Between the Social Context Variables and Knowledge Application Variables

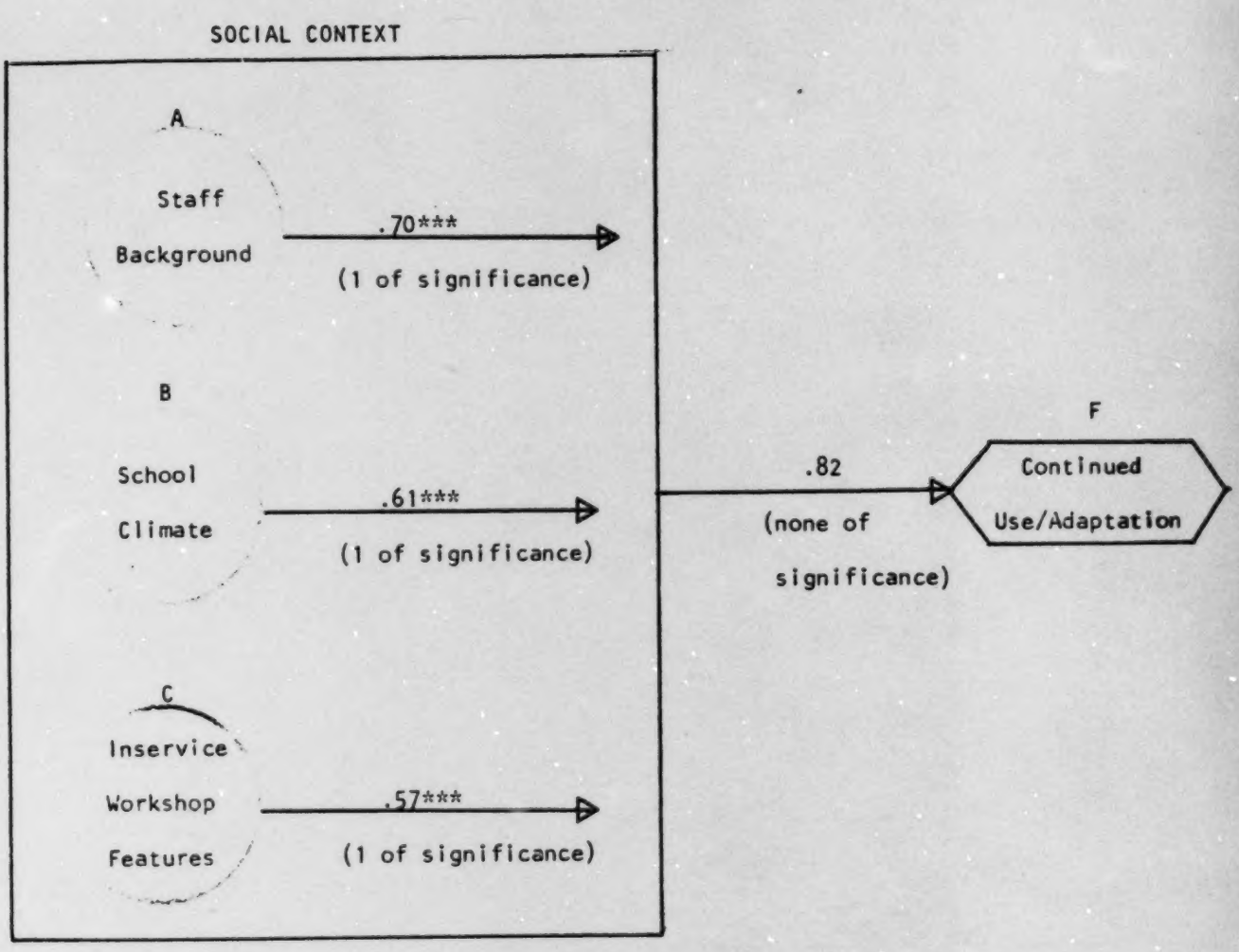


Figure 7: Canonical Correlations Between the Social Context Variables and the Continued Use/ Adaptation Variables.

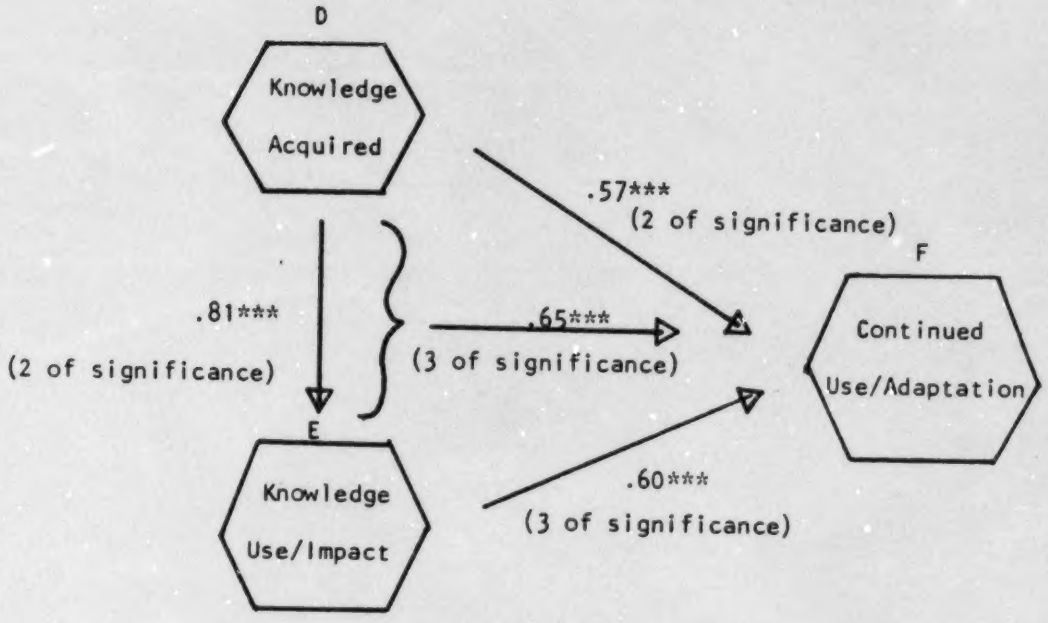
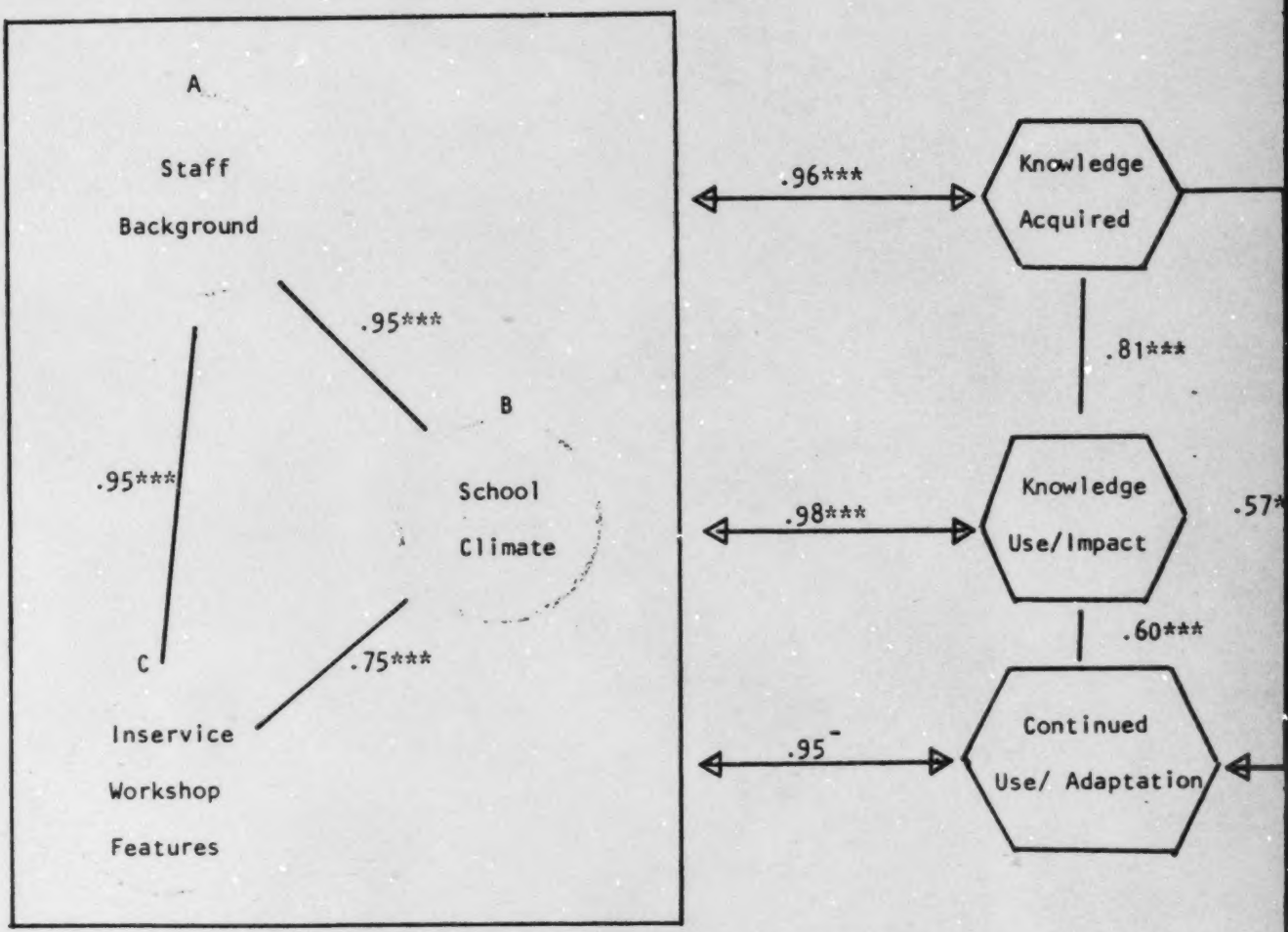


Figure 8: Canonical Correlations Among the Knowledge Use Process Variables.



*** = P .001

** = P .01

* = P .05

- = no significance

Figure 9: The Revised Conceptual Model with Canonical Correlations for All Variables

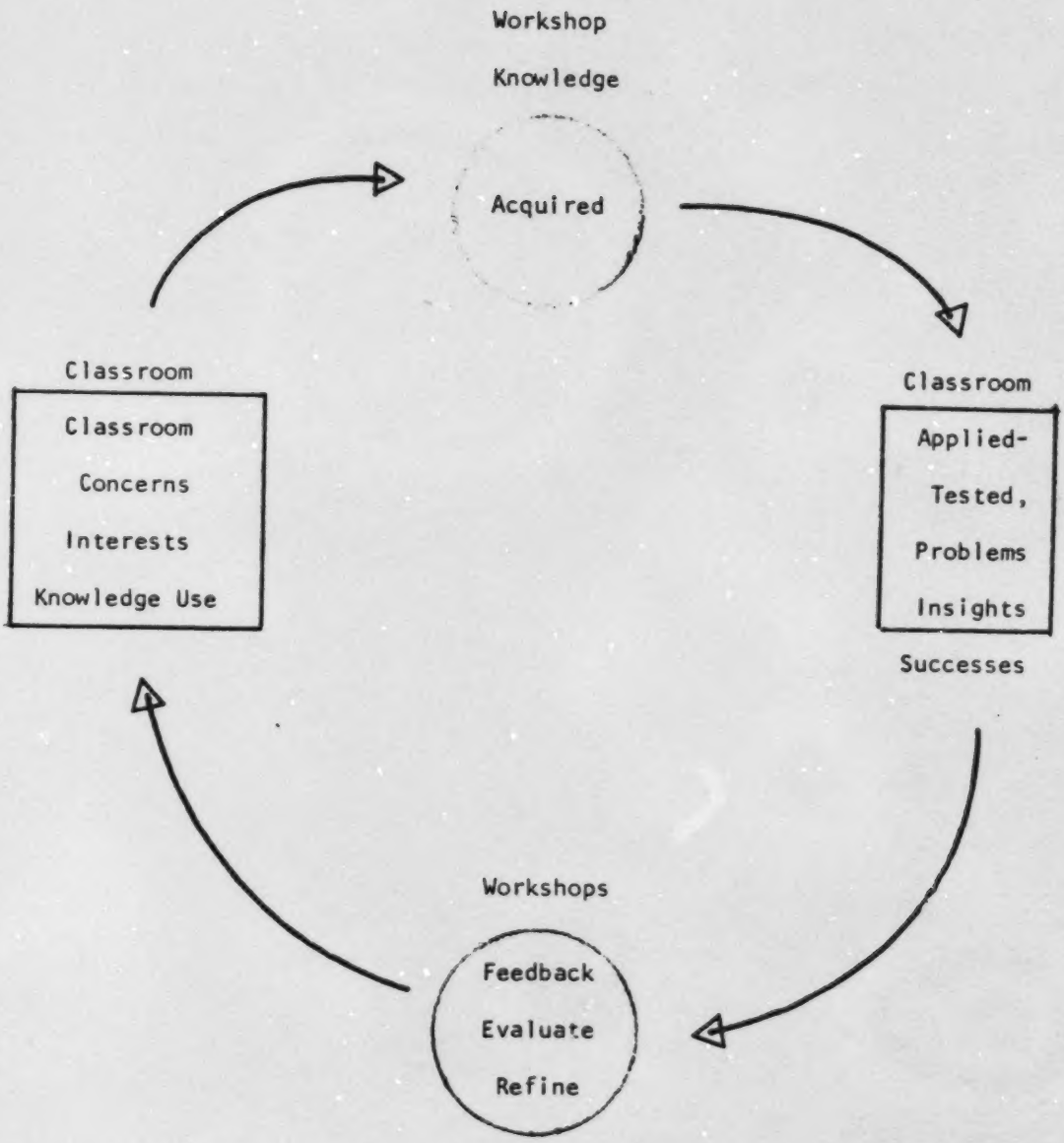


Figure 10: Staff Inservice for Knowledge Use Process

Table 1 : Staff Background, Traits

And Professional Characteristics ("A" Variables)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Staff Background Characteristics (A_1)			
Female (coded sequentially)			
Male	23.4%		
Female	76.6%		
Age range in years	22-65	40.3	9.05
Highest Degree attained (coded sequentially 1, 2, 3, etc.)	1-6	1.80	0.88
Years in Education	1-40	14.13	7.1
Years in Present School District	1-32	11.6	6.5
Years in Present School	1-32	8.9	6.3
Role in School			
Classroom Teacher	74.4%		
Special Needs Teacher	6.4%		
Specialist	11.9%		
Teacher with Administrative Role	4.3%		
Aide or Permanent Substitute	3.0%		
Majority of Time as an Educator			
Elementary Classroom Teacher	47.2%		
Junior High School Classroom Teacher	19.1%		
High School Classroom Teacher	13.2%		
Elementary Specialist	6.0%		
Secondary Specialist	4.3%		
Elementary Special Needs	3.4%		
Secondary Special Needs	1.7%		
Administrator	1.7%		

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Number of Credit Hours (taken at a college or univ. over the past two years)	0-60	4.9	7.6
Now Involved in an Inser. Workshop (follow up, coded sequentially)			
No	70.4%		
Yes	29.6%		
Number of days of Inservice Training Received Over the Past Two Years	0-65	9.2	10.5
Residence (Do you reside where you teach)			
No	41.8%		
Yes	59.2%		
Overall Job Satisfaction (follow up)		3.78	.90
Staff Professional Traits (A_2)			
Reflective	10-99	41.9	25.8
Experimental	10-99	56.5	26.7
Concrete	10-99	65.8	25.1
Abstract	10-99	40.1	23.7
Sphere of Personal Concern			
For own students, class & grade level		4.48	0.61
For fellow staff, & school		3.34	0.63
For community & district		3.38	0.67
Sphere of Involvement			
For own students, class & grade level		4.29	0.56

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Sphere of Involvement			
With fellow staff, & school		3.26	0.68
With community & district		3.18	0.73
Presentation Methods & Styles of Learning			
A Consultant lecturing		3.20	1.00
Doing written homework		2.64	1.00
Reading		3.58	0.83
From other colleagues in small group discussions		3.79	0.89
Hands-on activities		4.25	0.88
Developing projects or programs		3.73	1.06
A.V. presentations, slides simulations or games		3.72	0.95
Observing others do it		3.55	0.87
Practicing techniques, skills & behaviors at sessions		3.78	0.92
Putting information to practice in class(es)		4.27	0.75
Having consultant work with you in your class(es)		3.50	1.00

Table 1 (Continued)

Variable (Alpha)	Percentage Range	Mean	Standard Deviation
Psychological needs for:			
Achievement			
...with Students:			
Creating successful learning experiences for students (.56)		3.84	0.46
...with Peers:			
Colleagues tell you they learn from you (.78)		3.32	0.64
...with Supervisors:			
Being regarded as superior by supervisors (.76)		3.70	0.65
Power			
...over Students			
Students follow your directions (.77)		3.93	0.55
...over Peers:			
Fellow staff follow your suggestions (.80)		3.10	0.64
...over Supervisors:			
Persuade supervisors to do things your way (.78)		3.08	0.64

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Social Acceptance			
...by Students:			
For your students to like you (.66)		3.55	0.57
...by Peers:			
Socialize with fellow faculty (.76)		3.08	0.63
...by Supervisors:			
Have supervisors enjoy talking with you (.64)		3.12	0.65
Staff Inservice Needs and Expectations (A_3)			
New subject matter		3.81	0.94
New or varied teaching		4.02	0.82
Motivating students to learn		4.30	0.77
Use of workshops or learning excr.		3.17	1.03
Dealing with disruptive students		3.84	0.99
Working more effectively with special needs students		3.62	1.01
Enhancing social relationships		3.29	1.07
Working more effectively w/gifted children		3.88	1.00
Career/Vocational awareness for students		3.28	1.07
Improving interracial attitudes		3.23	1.09
Learning to better use community resources		3.48	0.97
Providing guidance and counseling		3.44	1.02

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Increasing awareness of own teaching style		3.88	0.88
Improving staff communications		3.68	0.97
Motives (coded 1= very low, to 5= very high)			
Interest in topic		4.07	0.96
Reputation of consultant		2.48	1.48
Convenient time/location		3.02	1.35
Need for inservice increments			
Low/no-cost course credits		2.48	1.44
Needs of students/classes		3.46	1.37
Interest in sharing ideas with staff		2.83	1.24
Expectations (coded 1= none, to 6= very high)			
Of upcoming inservice program		4.06	0.80
Of inservice training offered			
...at universities/colleges		4.51	1.30
...by universities/colleges own school		4.35	1.39
...at teacher centers/regional cooperatives		4.42	1.50
...by teacher centers/regional cooperative at own school/district		4.24	1.51
...by Commonwealth Inservice Institute		5.07	1.34

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Staff Inservice Experiences (A_4)			
Job status for the coming year:			
Staying	97.4%	.91	.29
Leaving	2.6%	.02	.13
Job satisfaction at end of Inservice (coded 1 = very low, to 5 = very high)		3.80	.76
Very high	16.1%		
High	52.9%		
Moderate	25.3%		
Low	5.2%		
Very Low	1.2%		
Number of Inservice Sessions Attended	1-20	8.0	3.18
Outside events effects on participants' personal life (coded 0 = none, to 4 = very positive)		1.43	1.31
Participants success in using knowledge acquired from inservice (coded 0 = none, to 4 = a great deal)		3.02	1.13
The extent to which the knowledge acquired complements participants' teaching style (coded 0 = none, to 4 = a great deal		3.13	1.19

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Reasons why participants used knowledge acquired from the inservice (coded 0 = not at all, to 4 = a great deal)			
Participants interest in the inservice topic		2.91	0.77
The needs of the participants' job		2.20	0.91
Questions asked in the six-month follow-up:			
Are you currently involved in an inservice program?		1.20	0.59
No	70%		
Yes	20%		
Some area	9%		
Current Job Satisfaction (coded 1 = very low, to 5 = very high)		3.75	0.84
Very high	15.5%		
High	53.1%		
Moderate	24.7%		
Low	5.0%		
Very low	2.7%		

Table 1 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
How much will your current successes with using the new knowledge influence your usfng it in the future (coded 0 = very low to 5 = very high)		3.22	1.12

Table 2 : School and Community Characteristics Climate, and Support for Inservice Use ("B" Variable)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
School and Community Characteristics (B_1)			
Classroom Characteristics:			
Large-Small		3.77	1.70
Low ability-High ability		3.80	1.22
Crowded-Spacious		3.76	1.60
Community:			
White collar-Blue collar		4.18	1.78
Non-supportive-Supportive		3.91	1.62
Ruran-Urban		3.38	1.63
Unfriendly-Friendly		4.66	1.29
Depressed-Prosperous		4.30	1.50
Commercial-Residential		5.51	1.42
Fragmented-Unified		3.73	1.39
(1) School Climate (B_2)			
Expectation (keep up professionally) (.81)		2.75	0.40
Learning Orientation (new prof. skills) (.77)		2.81	0.44
Expressiveness (respect creative work) (.59)		2.77	0.43
Leadership (enthusiastic about teaching) (.88)		2.55	0.55
Goal Direction (goals clearly understood) (.72)		2.65	0.48
Support (try new approaches) (.85)		2.54	0.48
Equal Treatment (special treatment) (.74)		2.54	0.53
Problem Solving (effectively addressed) (.79)		2.60	0.50

(1) Semantic differentials coded 1 to 7; 4 = neutral

Table 2 : School and Community Characteristics

Climate, and Support for Inservice Use ("B" Variable)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
(1) Classroom Characteristics:			
Traditional-Non-Traditional		3.23	1.44
Stressful-Satisfying		4.74	1.59
Unstructured-Structured		5.42	1.28
Passive-Active		5.53	1.06
Boring-Challenging		5.28	1.10
Unruly-Disciplined		5.61	1.12
Authoritarian-Democratic		4.02	1.44
School Characteristics:			
Fragmented-Unified		4.15	1.68
Passive-Active		4.38	1.50
Ineffective-Effective		4.97	1.38
Boring-Interesting		4.89	1.27
Unfriendly-Warm		5.19	1.37
Democratic-Authoritarian		3.89	1.51
Competitive-Cooperative		4.85	1.31

(1) Semantic differentials coded 1 to 7; 4 = neutral

Table 2 (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
School Support for Inservice (B_3)			
(2) Events:			
Certain students within class(es)		1.21	1.25
Your own classroom/class(es)		1.34	1.28
The classrooms & students of other teachers		1.30	1.03
Work of closest fellow staff		1.45	1.14
All teachers in school		1.37	0.96
Your department or grade level unit		1.37	1.13
School building as a whole		1.51	1.02
School district as a whole		1.44	0.98
Professional association or union		1.10	0.92
Parents of students you teach		1.29	1.08
Community where school is located		1.26	1.06

(2) The effect that external events or changes had on each of the variables, coded 0 = no effect, 1 = very negative effect, to 4 = very positive effect.

Table 3 : Inservice Workshop
Features and Instructional Characteristics
('C' Variables)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Inservice Workshop Features (C_1)			
Focus of Inservice Workshop:			
Basic Skills	24 %	0.24	0.43
Students with Special Needs	18.9%	0.40	0.80
Career Needs of Students	1.0%	0.04	0.34
Gifted and Talented Students	11.1%	0.60	1.43
Discipline & Behavior of Students	9.4%	0.58	1.60
Computer Assisted Instruction	35.4%	2.29	2.92
Other	9.5%	0.51	1.82
Reason for Attending Inservice Wkshp.:			
Participant initiated the idea	3.0%	0.03	0.17
Volunteered out of interest	60.8%	60.8	0.49
Saw it advertised	15.1%	15.1	0.35
Asked by colleague	7.8%	0.08	0.27
Felt it was responsibility	5.6%	0.06	0.23
Asked by supervisor/administrator	5.6%	0.02	0.13
Was ordered to attended	2.2%		

Table 3 : (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Source of Idea for Inservice Wrksp :			
Participant	3.0%	0.02	0.15
Fellow teacher	28.0%	0.27	0.45
Group of teachers	20.0%	0.19	0.40
Supervisor/Chairperson	18.2%	0.18	0.38
Building Principal	4.9%	0.05	0.21
District Administrator	1.8%	0.02	0.13
Outside Consultant	-0-		
School Committee/Parents	2.7%	0.03	0.16
Needs Assessment	2.2%	0.02	0.15
Unknown	20.0%	0.18	0.39
Importance placed on inservice by administrators (Coded 1 = very low to 4 = very high)		3.01	1.21
Number of sessions held in inservice	2-20	8.73	3.38
Amount of time devoted to inservice		2.25	0.71
Number of participants in inservice	8-60	20.31	8.59
Where participants came from (coded 1 = my school to 5 = different schools)		2.64	1.38

Table 3 : (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Instructional Characteristics and Behaviors (C_2)			
Number of Consultants Involved	0-9	2.04	1.64
Where the Consultants Came from:			
Participants' own school	16.3%	0.16	.037
Elsewhere in the same system	23.2%	0.45	0.84
Another school system	27.5%	0.82	1.34
A college or university	28.4%	1.13	1.80
A public agency or collaboration	12.0%	0.58	1.60
An independent consulting group	9.9%	0.57	1.76
Business or industry	8.6%	0.60	1.97
Extent to Which Consultant's Style Matched participants (coded 1 = not at all to 4 = a great deal)		3.31	0.77
Overall Effectiveness of the Consultant (coded 1 = very ineffective to 4 = very effective)		3.71	1.06
Participant Rating of Consultants' Effect. (coded 1 = very ineffective to 5 highly effective) (alpha = .97)		4.09	0.74
Relating to the participants		4.08	0.94
Understanding teachers' concerns		4.10	0.95
Encouraging participation		4.13	0.86

Table 3 : (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Stimulating interest in topic(s)		3.99	0.87
Making good use of time together		3.86	0.96
Demonstrating knowledge of topic(s)		4.46	0.73
Responding to participants' questions		4.30	0.85
Clearly explaining things		4.16	0.82
Using materials and resources		4.08	0.84
Completing the objectives of workshop		4.10	0.85
Leading/directing discussions		3.87	0.91
Providing participants with new info.		4.14	0.87
Meeting participants' needs & expect.		3.85	0.98
Extent to Which Consultant(s) Used			
Specific Methods of Instruction:			
Lecturing (Coded 0 = not at all to 3 = a great deal)		2.46	0.74
Doing written assignments		1.36	0.96
Reading information packages		1.67	0.90
Discussions with other participants		2.29	0.79
Hands-on activities		2.10	1.01
Developing activities, projects		1.91	1.00
Viewing A.V. presentations or films		0.77	0.98
Participating in simulations or games		1.38	1.06
Observing the instructor apply skills		1.46	1.04
Practicing skills, techniques		1.77	1.07
Applying skills in class(es)		1.68	1.03
Having instructor/consultant assist in own class(es)		1.09	1.11

Table 3 : (Continued)

Variable (Alpha)	Percentage/ Range	Mean	Standard Deviation
Participants' Rating of How Theoretical or Practical the Inservice Workshops Were: (Coded 1 = very theoretical to 4 = very practical) (alpha = .81)		3.15	0.41
The consultant's lectures		3.19	0.90
Doing written assignments		3.23	0.65
Reading information		2.86	0.86
Discussions with other participants		3.36	0.64
Engaging in hands-on activities		3.56	0.59
Developing activities		3.29	0.68
Viewing A.V. presentations		2.69	0.58
Participating in simulations		3.07	0.72
Observing instructor apply skills		3.09	0.69
Practicing skills, techniques		3.31	0.66
Applying skills in class(es)		3.28	0.75
Having instructor/consultant assist in own class(es)		2.94	0.63

Table 4 : Outcome Variables

(D, E, and F Variable Sets)

Variable (Alpha)	Mean	Standard Deviation
Knowledge Acquired (D Variables)		
1. Amount Learned (.80)		
Participants ratings of the amount of information they acquired about the following, (coded 0 = nothing at all to 3 = a great deal)	1.13	0.56
New subject matter or topics to teach	1.76	1.09
New or varied teaching methods/technology	2.19	0.95
Motivating students to learn/achieve	1.92	0.98
Use of worksheets or learning exercises	1.35	1.03
Dealing with disruptive students	0.72	1.04
Working with special needs (Chapter 766) students	0.96	1.11
Social relationships among students	0.85	1.00
Working with gifted and talented students	1.05	1.11

Table 4 (Continued)

Variable(Alpha)	Mean	Standard Deviation
Career/vocational awareness for students	0.73	0.96
Interracial attitudes or relationships	0.26	0.58
Learning to better use community resources	0.87	1.06
Providing guidance and counseling to students	0.72	0.99
Increasing your awareness of your own teaching style/ behavior	1.65	1.45
Improving staff communication and morale	0.82	0.99
2. How Learned (.80) Participants ratings of how much the following methods were used to disseminate knowledge in the inservice. (Coded 0 = not all all to 4 = a great deal)	1.84	0.69

Table 4 (Continued)

Variable (Alpha)	Mean	Standard Deviation
The consultant's (s') lectures	2.71	0.95
Doing written assignments	1.60	1.10
Reading information packages, books, etc.	1.92	0.97
Discussions with other participants	2.33	0.93
Engaging in hands-on activities	2.38	1.29
Developing activities, projects or programs	1.99	1.24
Viewing A.V. presentations or films	0.90	1.02
Participating in simulations or games	1.44	1.18
Observing the instructor or others apply skills	1.85	1.96
Practicing the skills, techniques or behaviors	2.00	1.24
Applying the skills, techniques or behaviors in your class(es)	1.85	1.23

Table 4 (Continued)

Variable(Alpha)		Mean	Standard Deviation
Having the instructor/ consultant assist you in applying skills, etc. with your own students/ class(es)		1.10	1.13
3. Overall Inservice Rating			
Participants' overall rating of the inservice project they completed (scored from 1 = a total failure to 4 = a huge success)		3.11	0.63
A total failure	2.6%		
Moderately unsuccessful	6.6%		
Moderately successful	67.3%		
A huge success	23.5%		
4. Knowledge Acquired (.86)			
How much new information, skills, behaviors, activities, or attitudes participants acquired from their recent inservice project (coded from 0 = none at all to 4 = an extraordinary amount)		2.23	0.78
1. Information (ideas)		2.66	0.89
2. Skills (techniques)		2.42	1.02
3. Behaviors		1.83	1.10
4. Activities (worksheets, etc.)		1.86	1.17
5. Attitudes		2.08	1.56

Table 4 (continued)

Variable (Alpha)	Mean	Standard Deviation
Knowledge Use/Impact (E Variable)		
1. Knowledge Applied (.92) Frequency of use (applied, tried out) of knowledge acquired through the inservice experience (coded 0 = not at all to 4 = continually)	2.20	1.18
1. Information (ideas)	2.17	1.40
2. Skills (techniques)	2.17	1.46
3. Behaviors	1.67	1.51
4. Activities (worksheets, etc.)	1.55	1.48
5. Attitudes	1.82	1.57
2. Work Effect (.91) The level of impact (effect) the recent inservice project had on each of the following. (Coded from 0 = none at all to 5 = extremely high)	1.87	1.03
Certain students within your class(es)	2.04	1.38
Your own classroom/class(es)	2.08	1.31
The classrooms and students of other teachers in your school	1.80	1.37
The work of a few of your closest fellow staff members	2.13	1.34
All teachers in your school	1.54	1.18
Your department or grade level unit	1.74	1.38

Table 4 (continued)

Variable (Alpha)	Mean	Standard Deviation
Your school building as a whole	1.77	1.30
Your school district as a whole	1.61	1.27
Your professional association or union	0.80	1.04
The parents of students that you teach	1.14	1.26
The community in which your school is located	1.08	1.27
Your personal life	1.98	1.44
3. Work Capacity (.88)		
The effect which the inservice project had on participants' perception of their ability (capacity) to do the following. (Coded from 1 = very negative impact to 4 = very positive impact)	1.67	1.88
1. Create challenging and effective learning experiences for students	2.72	1.41
2. Command respect and/or be acknowledged by fellow teachers for professional achievement and skill	1.65	1.59
3. Gain recognition for superior teaching from supervisors or administrators	1.32	1.61
4. Relate well to students in classrooms	2.16	1.60
5. Get along well with other teachers in the school	1.38	1.59

Table 4 (continued)

Variable (Alpha)	Mean	Standard Deviation
6. Relate effectively and comfortably to supervisors or administrators	1.35	1.61
7. Control class(es) and students' behavior	1.21	1.61
8. Influence fellow teachers in things that are important	.99	1.44
9. Influence supervisor/administrator in things that are important	1.07	1.52
4. Predicted Use (.90)		
Participants' ratings of the likelihood that they will use the skills, knowledge, behavior acquired through the inservice in the coming year. (Coded 0 = not at all to 4 = very likely)	3.12	1.04
Information	3.29	1.09
Skills	3.23	1.13
Behaviors	2.90	1.43
Activities	2.64	1.44
Attitudes	2.77	1.39
Continued Use/Adaptation (F Variables)		
1. Continued Knowledge Use (.93)		
How much information, skills, etc. that participants acquired from their past inservice project are they using. (Coded from 0 = none at all to 4 = a great deal)	2.48	1.27

Table 4 (Continued)

Variable (Alpha)	Mean	Standard Deviation
Information	2.52	1.41
Skills	2.35	1.52
Behaviors	2.23	1.53
Activities	1.86	1.57
Attitudes	2.54	1.52
2. Adaptation (.85)		
How much participants have adapted or changed the information and knowledge they acquired during the six months. (Coded 0 = none at all to 4 = a great deal)	1.30	0.67
Information	1.17	0.93
Skills	1.40	0.89
Behaviors	1.30	0.94
Activities	1.45	0.99
Attitudes	1.37	1.00
3. Future Use (.93)		
Participants' ratings of the likelihood that they will continue to use the knowledge or information acquired from the inservice in the future. (Coded 0 = not at all to 4 = very likely)	3.02	1.05
Information	3.10	1.20
Skills	3.00	1.25
Behaviors	2.83	1.26
Activities	2.56	1.43
Attitudes	3.01	1.20

Table 5 : Correlations Among
The 12 Dependent Variables

	Amount Learned	How Learned	Wrkshp. Rating	Future Inservice	New Knowledge	Knowledge Used	Work Impact
Workshop Effects/Knowledge Acquired							
Amount Learned		.51	.24	.29	.49	.39	.40
How Learned	.51		.42	.46	.62	.35	.38
Workshop Rating	.24	.42		.54	.50	.37	.28
Future Attitude Toward Inservice	.29	.46	.54		.52	.36	.37
New Knowledge Acquired	.49	.62	.50	.52		.51	.42
Knowledge Use/Impact							
Used	.39	.35	.37	.36	-.51		.48
Work Impact	.40	.38	.27	.37	.42	.48	
Work Capacity	.49	.31	.23	.35	.39	.38	.49
Predicted Use	.43	.37	.48	.58	.60	.55	.44
Continued Use/Adaptation							
Continued Use	.30	.13	.18	.23	.27	.55	.31
Adaptation	.03	-.08	-.16	-.06	-.05	-.03	-.01
Future Use	.32	.16	.18	.32	.31	.41	.31

Table 5 (Continued)

	Work Capacity	Predicted Use	Continued Use	Adaptation	Future Use
Workshop Effects/Knowledge Acquired					
Amount Learned	.49	.43	.30	.03	.32
How Learned	.31	.37	.13	-.08	.16
Workshop Rating	.23	.48	.18	-.16	.18
Future Attitude Toward Inservice	.35	.58	.23	-.06	.32
New Knowledge Acquired	.39	.60	.27	-.05	.31
Knowledge Use/Impact					
Used	.38	.55	.55	.03	.41
Work Impact	.49	.44	.31	-.01	.31
Work Capacity		.45	.31	.03	.29
Predicted Use	.45		.44	-.05	.53
Continued Use/Adaptation					
Continued Use	.31	.44		.02	.62
Adaptation	.03	-.05	.02		-.04
Future Use	.29	.53	.62	-.04	